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EXAMINER	
NGUYEN, HUNG THANH	

ART UNIT	PAPER NUMBER
2841	

DATE MAILED: 03/09/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/825,662	CHANG, JUNG-CHIEN	
	Examiner	Art Unit	
	HUNG T. NGUYEN	2841	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 January 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4 and 7-20* is/are pending in the application.

4a) Of the above claim(s) *5 and 6* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4, 7-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 1-4, 14, 17 are rejected under 35 U.S.C. 102(b) as being anticipated by Feng et al. (US 5,081,563).

Regard claim 1, 14: Feng et al. discloses in figures 1-6 a functional printed circuit board (PCB) module having an embedded chip, the PCB module comprising: a frame (10) having two opposite sides (34, 38) and at least one chip recess (42) defined in the frame (10), a first printed circuit (including all elements of 22, 32A, 54, 62, 64) formed on one side of the frame (10) and insulated (60) from the frame (10), at least one chip (54) mounted in the at least one chip recess (42) and connected (see figures) to the first printed circuit (including all elements of 22, 32A, 54, 62, 64), wherein the at least one chip (54) has a top face (facing toward 34), a bottom face (facing toward 38) and multiple terminals (62, 64, 66) each of which is formed (see figures) on the top face (facing toward 34) and connected (see figures) to the first printed circuit (including all elements of 22, 32A, 54, 62, 64), and insulation material (see figures 3-4) filling the at least one chip recess (42).

Regard claim 2: Feng et al. discloses 1-6 the functional PCB module wherein the frame (explain in claim 1) is nonmetallic (see column 3, lines 23-51).

Regard claim 3: Feng et al. discloses in figures 1-6 the functional PCB module wherein the frame (explain in claim 1) is metal (see column 3, lines 23-51) and further comprises a first insulation layer (60) between the first printed circuit (explain in claim 1) and the frame (explain in claim 1).

Regard claim 4, 17: Feng et al. discloses in figure 1-6 the functional PCB module wherein the first insulation layer (explain in claim 3) has multiple through holes (22, 24, 26, 28, 30) corresponding to the terminals (explain in claim 1) defined through the first insulation layer (explain in claim 3) and the insulation material (explain in claim 1) in the at least one chip recesses (explain in claim 1); and multiple plugs (32A-32F) are formed respectively in corresponding through holes (43) to connect (see figures) the first printed circuit (explain in claim 1) to the at least one chip (explain in claim 1).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 5-13, 15-16, 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Feng et al. (US 5,081,563) in view of Marcinkiewicz et al. (US 5,241,456) and Degani et al. (US 5,646,828).

Regard claim 5, 10, 15: Feng et al. discloses all elements of the functional PCB module in figures 1-6 as described above with respect to claim 1 except, Feng et al.

does not disclose the functional PCB module further comprised a second insulation layer formed on the other side of the frame a second printed circuit layer formed on the second insulation layer; and multiple vias each of which has an outside and is formed through the first printed circuit the first insulation layer the frame the second insulation layer and the second printed circuit to connect the first printed circuit to the second printed circuit.

Marcinkiwicz et al discloses in figures 1 the functional PCB module further comprised a second insulation layer formed on the other side of the frame, a second printed circuit layer formed on the second insulation layer, and multiple vias each of which has an outside and is formed through the first printed circuit the first insulation layer the frame the second insulation layer and the second printed circuit to connect the first printed circuit to the second printed circuit.

Feng et al. and Marcinkiwicz et al. are analogous art because they are from the same field of endeavor to make multi-layer package.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art, to make elements as described above of Feng et al. to modify its invention as taught by Marcinkiwicz.

Therefore, it would have been obvious for one ordinary skill in the art to combine Feng et al. with Marcinkiwicz et al. for the benefit of reducing size and costs.

Regard claim 6, 11: Feng et al. discloses all elements of the functional PCB module as described in claim 1 including an insulation well is formed around the outside of each

via between the first insulation layer. Feng et al. does not disclose the second insulation layer to insulate the via from the frame.

Marcinkiwicz et al. discloses the second insulation layer to insulate the via from the frame.

Feng at al. and Marcinkiwicz et al. are analogous because they are in the same field of endeavor to make multi-layer package.

At the time of the invention, it would have been obvious for one ordinary skill in the art, to make insulation layer of Feng et al. to insulate the via as taught by Marcinkiwicz et al. Therefore, it would have been obvious for one ordinary skill in the art to combine Feng et al. with Marcinkiwicz et al. for the benefit of insulating the electrical connection.

Regard claim 7, 16: Feng et al. discloses all elements of the functional PCB module as described above with respect to claim 1. Feng et al. does not disclose a second insulation layer formed on the other side of the frame, a second printed circuit layer formed on the second insulation layer; and multiple vias each of which has an outside and is formed through the first printed circuit, the first insulation layer, the frame, the second insulation layer and the second printed circuit to connect the first printed circuit to the second printed circuit.

Marcinkiwicz discloses in figures 1 a second insulation layer formed on the other side of the frame, a second printed circuit layer formed on the second insulation layer; and multiple vias each of which has an outside and is formed through the first printed circuit, the first insulation layer, the frame, the second insulation layer and the second printed circuit to connect the first printed circuit to the second printed circuit.

Feng et al. and Marcinkiwicz et al. are analogous art because they are from the same field of endeavor to make multi-layer package.

At the time of the invention, it would have been obvious for one ordinary skill in the art to make elements as described above of Feng et al. to modify its invention as taught by Marcinkiwicz.

Therefore, it would have been obvious for one ordinary skill in the art to combine Feng et al. with Marcinkiwicz et al. for the benefit of reducing costs.

Regard claim 8, 12, 18: Feng et al. discloses all elements of the functional PCB module as described above with respect to claim 1 except, Feng et al. does not disclose each chip has multiple solder bumps formed respectively on the terminals, and the solder bumps are connected to the second printed circuit.

Degani et al. discloses each chip has multiple solder bumps formed respectively on the terminals, and the solder bumps are connected to the second printed circuit.

Feng et al. and Degani et al. are analogous art because they are from the same field of endeavor to make multi-layer package.

At the time of the invention, it would have been obvious for one ordinary skill in the art, to make each chip of Feng et al. to have solder bumps as taught by Degani et al.

Therefore, it woud have been obvious for one ordinary skill in the art to combine Feng et al. with Degani et al. for the benefit of less space and low costs.

Regard claim 9, 13, 19, 20: Feng et al. discloses all elements of the functional PCB module as described as respect to claim 1 except, Feng et al. does not disclose the

bottom face of each chip is attached to the second printed circuit, and the terminals of each chip are connected to the second printed circuit by wire bindings.

Marcinkiwicz et al. discloses the bottom face of each chip is attached to the second printed circuit, and the terminals of each chip are connected to the second printed circuit by wire bindings.

Feng et al. and Marcinkiwiewicz are analogous art because they are from the same field of endeavor to make multi-lay package.

At the time of the invention, it would have been obvious for one ordinary skill in the art to make chip of Feng et al. to connect by wire bindings as taught by Marcinkiewicz.

Therefore, it would have been obvious for one ordinary skill in the art to combine Feng et al. with Marcinkiewicz for the benefit of connecting chip to devices.

Response to Arguments

Applicant's arguments filed 1/19/06have been fully considered but they are not persuasive.

Regard argument 1: Applicant argues that "no conductive wires or layers are form in the substrate". This argument is not found to be persuasive because Feng et al. discloses frame (10) having two opposite sides (34, 38, see column 3, lines 52-60 for the two substrate sides).

Regard argument 2: Applicant argues that "no printed circuits are formed on substrate, chip is held in the hole of the frame and chips are mounted not formed through the substrate". This argument is not found to be persuasive because Feng et al. discloses

printed circuit board (32A-f, 54) are formed on substrate, chip (54) is held in the hole (42, 44, 46, see column 3, lines 52-60) of the frame (10) and chips (54, 56, 58) are formed through the substrate.

Regard claim 1, 14: Applicant argues that a frame having two opposite sides and at least one chip hole defined through the frame. This argument is not found to be persuasive because Feng et al. discloses at least one chip hole (42, 44, 46, see column 3, lines 61-68) defined through the frame (10, see column 3, lines 23-30).

Regard claim 4: Applicant argues that the insulation material in the at least one chip recesses. This argument is not found to be persuasive because Feng et al. discloses the insulation material (60, see column 4, lines 23-37) in the least one chip recesses (42, 44, 46).

The remain of the arguments are moot in view of the claim amendments.

Relevant Art

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The Bone Robert (US 5,600,541) teaches the multi-layer with staking chip, Miyazaki et al. (US 6,335,669) teaches multi chips on multi-layers, Umeda, Osami (US 5,398,160) teaches multi-chip with wire bonds, Yoneda Yoshihiro (US 5,615089) teaches multi chips with solder bumps.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Hung Thanh Nguyen 2/21/06

HN

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